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EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,431	HERLEIKSON ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,17,18,20-22 and 24-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,17,18,20-22 and 24-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004).

Regarding claim 1, Fuller et al. discloses a method for measuring a desired condition, comprising:

generating (Fig. 2, block 50, column 5, line 48-column 6, line 21) a clock signal;

selecting frequencies with a preselected spectra (comb spectra) in accordane with the clock signal such that the frequencies within the spectrum are selected (column 5, line 66-column 6, line 21);

directing (5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) spread spectrum input signals into a medium at the frequencies;

detecting Fig. 5B, block 250, column 13, lines 24-60 and column 16, lines 34-38) output signals from the medium, each output signal detected at a frequency (real and imaginary components of the reflected data signal) that corresponds to the frequency of a corresponding input signal directed into the medium (column 12, lines 41-52);

generating (Fig. 5B, block 280, column 12, lines 41-52 and column 13, lines 53-60) a measured parameter signal (impedance signal) from the detected parameter; and

analyzing (Fig. 5B, block 280, column 16, lines 19-24) the measured parameter signal to determine the desired condition.

Fuller et al. does not disclose randomizing the clock signal to generate randomized frequencies from the clock signal. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or harmonically spaced apart. Thus, claim 1 does not constitute patentability.

Regarding claims 2-5, which inherit the limitations of claim 1, Fuller et al. discloses transmitting spread spectrum voltage signals into the medium (column 9, lines 54-62) and detecting a parameter that corresponds to the signal directed into the medium comprises measuring the voltage signals (column 8, lines 19-27, column 9, lines 54-62, and column 16, lines 19-24). Fuller et al. and Abraham do not disclose transmitting current signals into the medium and measuring current signals for detecting a parameter of the signal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made

since the measured parameter signal generated from the detected parameter comprises of an impedance signal (column 13, lines 53-60), that a current signal or a voltage signal could have been directed into the medium, and a current or voltage signal could have been measured to detect a parameter in the signal since an impedance signal can be derived from either a voltage or current signal. Impedance can be measured by inputting a current signal into a medium and measuring a voltage drop across the medium due to impedance (and vice versa). Thus, inputting and measuring a current or voltage signal would produce the same result (impedance signal). The operation of choosing a voltage or current signal is deemed a design choice and does not constitute patentability.

Regarding claim 6, which inherits the limitations of claim 1, Fuller et al. discloses a method for measuring a desired condition, comprising:

generating (column 6, lines 1-21, oscillator) a clock signal for spreading a signal across a selected frequency spectrum;

directing (Fig. 2, block 50, Figs. 5A and 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) spread spectrum electrical input signals spread across the selected frequency spectrum to the medium;

detecting (Figs. 5A and 5B, block 250, column 12, lines 41-52, column 13, lines 24-60 and column 16, lines 34-38) electrical response signals at the frequencies of the input signals;

generating (Figs, 5A and 5B, block 280, column 12, lines 41-52 and column 13, lines 53-60) an impedance signals (column 12, lines 41-52 and column 13, lines 53-60) from the input and response signals at each input signal frequency;

analyzing (Figs. 5A and 5B, block 280, Abstract and column 16, lines 19-24) the measured impedance signals to determined the desired condition.

Fuller et al. does not disclose randomizing the clock signal to generate randomized frequencies from the clock signal. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or harmonically spaced apart. Thus, claim 6 does not constitute patentability.

Regarding claim 7, which inherits the limitations of claim 6, Fuller et al. discloses analyzing the impedance signal to determine a contact impedance of a device electrode (column 2, lines 57-65 and column 15, line 48-column 16, line 24).

Regarding claim 28, Fuller et al. discloses a spread spectrum physiological condition measurement device comprising:

a (Fig. 5B, block 300) medium which contacts a patient;

a transmitter (Fig. 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) for conveying an input signal to the medium at selectable frequencies;

a signal detector (Fig. 5B, block 270, column 12, lines 41-51) electrically connected to the medium to detect signal at the selectable frequencies;

a signal generator (column 5, line 66-column 6, line 21) which supplies a signal to the transmitter and the signal detector which causes signal to be transmitted and received at each of a plurality of selected frequencies within a preselected spectrum;

a processor (Fig. 5B, block 270, column 12, lines 41-51, and column 15, lines 48-column 16, line 10) programmed to analyze the detected signals to measure a selected physiological condition at the plurality of frequencies to generate a measurement of the physiological condition that is isolated from interference on one or some of the plurality of frequencies.

Fuller et al. does not disclose the signal generator is random and used to generate randomized frequencies. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or harmonically spaced apart. Thus, claim 28 does not constitute patentability.

3. Claims 17, 18, 20, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Abraham (previously cited in Office Action 3/29/2005).

Regarding claim 17, Fuller et al. discloses a spread spectrum measurement device for measuring a desired physiological condition of a patient while avoiding degradation in an accuracy of the measured physiological conditions due to interference from nearby electronic equipment, the device (Figs. 1-5B), comprising:

means (Fig. 2, block 50, Figs. 5A and 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) for transmitting signals at different frequencies into a medium;

means (column 9, line 54-column 10, line 14) for detecting signals from the medium at different frequencies;

means (column 9, line 54-column 10, line 14) for generating a measured parameter from pairs of the transmitted and detected signals at common frequencies; and

means for analyzing (column 10, lines 40-55) the measured parameter signal to measure the desired physiological condition; and

means for generating (column 6, lines 1-21) a clock signal.

Fuller et al. does not disclose the device contains a random number generator and a divider which receives a clock signal and generated random numbers to generate a randomized clock signal, the randomized clock signal being conveyed to the transmitting means and to the detecting means to control the transmitting means and the detecting means to transmit and detect signals an random frequencies across a selected spectrum. However, Fuller et al. disclose that

the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or harmonically spaced apart. Abraham discloses a random signal generator for generating a clock signal that is used to spread a signal directed into a medium across a desired frequency by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Using a randomizer and divider to produce the clock signal used to create the spread spectrum signal of Fuller et al. would not change the functionality of the device since it is obvious that the device of Fuller et al. could also incorporate randomized spread spectrum signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that spread spectrum signals of Fuller et al. could have been generated by the teachings of Abraham to also produce a randomized spread spectrum signal. Spread spectrum signals are highly resistant to noise and interference across a propagation medium.

Regarding claim 18, Fuller discloses the spread spectrum measurement device of claim 18 (see rejection of claim 17) including the device at least partially comprised within a computer readable medium (column 13, lines 47-67):

Regarding claim 20, Fuller et al. discloses a spread spectrum measurement device (Figs. 2, 5A, and 5B), comprising:

a medium interface (Fig. 5B, block 300);

a signal transmitter (Fig. 5B, block 260, column 5, lines 11-25 and 48-59, and column 5, line 66-column 6, line 21) which transmits a spread spectrum electrical input signal to the medium interface;

a signal detector (Fig. 5B, block 250, column 13, lines 24-60) configured to detect a spread spectrum signal at the medium interface, the signal detector being in electrical communication with the medium interface; and

a signal processor (Figs. 5A and 5B, block 280, column 12, lines 40-51 and column 16, lines 19-24) configured to analyze the spread spectrum signal detected by the signal detector.

Fuller does not disclose a random signal generator configured to generate a clock signal that is used to spread the signal directed into a medium across a desired frequency by randomizing the clock signal with a random number generator and a divider.

However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or

harmonically spaced apart. Abraham discloses a random signal generator for generating a clock signal that is used to spread a signal directed into a medium across a desired frequency by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Using a randomizer and divider to produce the clock signal used to create the spread spectrum signal of Fuller et al. would not change the functionality of the device since it is obvious that the device of Fuller et al. could also incorporate randomized spread spectrum signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that spread spectrum signals of Fuller et al. could have been generated by the teachings of Abraham to also produce a randomized spread spectrum signal. Spread spectrum signals are highly resistant to noise and interference across a propagation medium.

Regarding claim 24, which inherits the limitations of claim 6, Fuller discloses all the limitations of claim 6 (see rejection of claim 6 above) including generating a clock signal (column 5, line 66-column 6, line 21). Fuller does not disclose generating random numbers and dividing the clock signal by the generated random numbers to generate the randomized clock signal. However, Fuller et al. disclose that the clock signal (oscillator) used to generate the frequencies in the spectrum could comprise a plurality of signal (spread spectrum) generators whose frequency outputs may not be harmonically related or harmonically spaced apart (column 6, lines 1-21). Since the frequencies do not have to be related, it would be obvious that the frequencies could have been generated at random within the spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the clock signal (oscillator) of Fuller et al. could have been randomized to produce randomized frequencies since Fuller et al. discloses that frequencies do not have to be harmonically related or

harmonically spaced apart. Abraham discloses a random signal generator for generating a clock signal that is used to spread a signal directed into a medium across a desired frequency by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Using a randomizer and divider to produce the clock signal used to create the spread spectrum signal of Fuller et al. would not change the functionality of the device since it is obvious that the device of Fuller et al. could also incorporate randomized spread spectrum signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that spread spectrum signals of Fuller et al. could have been generated by the teachings of Abraham to also produce a randomized spread spectrum signal. Spread spectrum signals are highly resistant to noise and interference across a propagation medium.

Regarding claim 25, which inherits the limitations of claim 17, Fuller et al. discloses the analyzing means determines impedance at each of the transmitted and detected frequencies (column 12, lines 41-51).

Regarding claim 26, which inherits the limitations of claim 25, Fuller et al. discloses the analyzing means analyzes the physiological condition measured at each frequency for consistency (column 16, lines 36-47 and column 14, lines 14-27).

Regarding claim 27, which inherits the limitations of claim 20, Fuller et al. discloses the signal processor determines at least one of contact impedance, heart rate, and respiration rate from the analyzed spread spectrum detected signal (column 15, line 28-column 16, line 24).

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Nappholz et al. (previously cited in Office Action 8/13/2004).

Regarding claim 8, Fuller et al. and Abraham disclose all the limitations of claim 8 (see rejection of claim 6) except the analyzing the impedance signal to determine a heart rate of a patient.

Nappholz et al. discloses analyzing an impedance signal from electrodes to determine a heart rate of a patient (column 10, line 1-17). Fuller et al. also discloses using electrodes to determined an impedance signal but does not disclose these electrodes are arranged to detect an impedance signal near the heart (column 2, lines 57-65 and column 15, line 48-column 16, line 24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Fuller et al. with the teachings of Nappholz et al. and place the electrodes in an arrangement to detect an impedance signal from the heart from which a heart rate can be determined to increase the overall functioning capacity and flexibility of the device by now being able to not only detect blood concentration levels, but also heart rate.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) New Jr. et al (previously cited in Office Action 8/13/2004).

Regarding claim 9, Fuller et al. discloses all the limitations of claim 9 (see rejection of claim 6) except the analyzing the impedance signal to determine a respiration rate of a patient.

New Jr. et al. discloses analyzing an impedance signal from electrodes to determine a respiration rate of a patient (column 8, line 59-column 9, line 44). Fuller et al. also discloses using electrodes to determined an impedance signal but does not disclose these electrodes are arranged to detect an impedance signal near the chest cavity (column 2, lines 57-65 and column

15, line 48-column 16, line 24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Fuller et al. with the teachings of New Jr. et al. and place the electrodes in an arrangement to detect an impedance signal from the chest cavity from which a respiration rate can be determined to increase the overall functioning capacity and flexibility of the device by now being able to not only detect blood concentration levels, but also respiration rate.

6. Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Papadakis et al. (previously cited in Office Action 8/13/2004).

Regarding claims 10 and 21, Fuller et al. discloses all the limitations of claims 10 and 21 (see rejection of claims 1 and 28) except transmitting a spread spectrum ultrasound signal into the medium.

Papadakis et al. discloses transmitting a spread spectrum signal ultrasound signal into a medium to detect changes in the properties within the medium (column 3, lines 21-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Fuller et al. with the teachings of Papadakis et al. and allow the transmission of a spread spectrum signal ultrasound signal into the medium since it is known that ultrasound signals can be used to detect desired conditions such fetal heart rate. This would increase the overall functioning capacity and flexibility of the device of Fuller et al. by now being able to not only detect blood concentration levels, but also desired conditions which can be detected using ultrasound signals.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Papadakis et al. (previously cited in Office Action 8/13/2004) and in further view of Feldman et al. (previously cited in Office Action 8/13/2004).

Regarding claim 11, which inherits the limitations of claim 10, Fuller et al. and Papadakis et al. disclose all the limitations of claim 11 (see rejection of claim 10, including analyzing reflections (echoes) at each frequency of the spread spectrum input signal (Fuller et al., column 8, lines 41-51)), except analyzing echoes of the ultrasound signal to determine the heart rate of a patient.

Feldman et al. discloses analyzing echoes (reflected energy) of an ultrasound signal to determine a fetal heart rate (column 1, lines 28-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Fuller et al. and Papadakis et al. with the teachings of Feldman et al. and analyze the ultrasound signal to determine the heart rate of a patient which would increase the overall functioning capacity and flexibility of the device of Fuller et al. and Papadakis et al. by now being able to not only detect blood concentration levels, but also heart rate using the ultrasound signal.

8. Claims 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al. (previously cited in Office Action 8/13/2004) in view of Kinast et al. (previously cited in Office Action 8/13/2004).

Regarding claim 22, Fuller et al. discloses all the limitations of claim 22 (see rejection of claim 28) except the transmitter transmits a spread spectrum light signal.

However Kinast et al. discloses transmitting a light signal to a medium and analyzing the results of the signal propagation to determine the level of blood oxygen (column 7, lines 12-67). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Fuller et al. with the teachings of Kinast et al. in order to allow the device to also transmit spread spectrum light signals. This would increase the overall functioning capacity and flexibility of the device of Fuller et al. by now being able to not only detect blood concentration levels, but to also detect blood oxygen levels using the light signals.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
September 16, 2005

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